REMARKS

Claims 47-65 remain in this application. (Claims 1-29 were canceled by an amendment, mailed December 26, 2001, and claims 30-46 have been cancelled by this amendment.) In view of the following remarks, Applicants respectfully request favorable consideration and timely indication of allowance.

Claims 30-46 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Margrain (U.S. Pat. 3,805,104) in view of W. Angele (U.S. Pat. 3,209,187), Lifschitz (U.S. Pat. 3,698,079), Karol (U.S. Pat. 3,650,021), Toshiba (Japan Pat. 05328678A) and/or Kliman (U.S. Pat. 5,793,138). These claims have now been cancelled, without prejudice.

Claims 47-49, 50, 54 and 56-60 have been rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Margrain in view of Umeki (U.S. Pat. 3,805,104); claims 51-53 have been rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Margrain in view of Umeki and further in view of Karol; claim 55 has been rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Margrain in view of Umeki and further in view of Toshiba; and claims 61-63 have been rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Margrain in view of Umeki and further in view of Kliman. These rejections are respectfully traversed and reconsideration of the same is earnestly requested.

Applicants disclose a novel and unobvious high efficiency coreless armature for electromotive applications. The coreless armature is constructed with a pair of concentric, conductive sheet metal windings separated by a thin insulator, such as glass fiber strands wrapped around the inner winding. The thin insulator replaces the substrate used in conventional printed circuit applications. To provide the structural support for motor applications, the armature is encapsulated in a non-layered material that extends through the windings. Claim 47 specifically recites winding portions "encapsulated in a ***non-layered*** material" that extends through the pair of windings.

The Patent Office primarily relies on Margrain to support the rejections. According to the Patent Office, Margrain discloses an armature formed from a pair of concentric conductive sheet metal windings encapsulated in potting material. However, as correctly noted by the Patent Office, Margrain does not disclose that the windings are encapsulated in a non-layered material that extends through the pair of windings. Instead, Margrain appears to disclose an example of the very prior art technique of using printed circuits that was disclosed in the Background of the Invention of this application. *See* Specification at p. 2, line 28 – p. 3, line 23.

The Patent Office nevertheless contends that the non-layered feature is found in Umeki and that it would have been obvious at the time of the invention to one having ordinary skill in the art to have modified the inductive coil of Margrain and provide it with the encapsulating material configuration disclosed by Umeki. This contention is respectfully traversed and reconsideration of the same is earnestly requested.

The burden of supporting a claim of obviousness initially lies with the examiner:

> The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

M.P.E.P. § 2142.

To sustain this burden, three criteria must be met wholly independent of applicants' disclosure:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.
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> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.

M.P.E.P., § 2143.

These requirements have not been met here.

In addressing this question, applicants note that Margrain teaches two embodiments – a printed circuit embodiment in Figs 12-13 and a sheet metal embodiment in Fig. 5. It is not entirely clear which embodiment is being relied upon by the Patent Office. (At one point in the rejection, the Patent Office claims that Margrain discloses "sheet metal winding portions" (top of p.9). This suggests a reference to the Fig. 5 embodiment in Margrain. At another point in the office action, however, reference is made to Figs. 12-13 (middle of p.9).) In any event, the requirements for establishing a *prima facie* case of obviousness are not met in connection with either embodiment.

Turning first to the printed circuit embodiment (e.g., Fig. 5), there was no motivation or suggestion to modify Margrain to use the non-layered potting that extends through the pair of

windings that was taught by Umeki. The Patent Office alleges that Umeki taught the use of non-layered potting to prevent the armature coil from separating when a strong tensile force is exerted. However, there is no suggestion in Margrain that separation is a problem with the printed circuit embodiment. To the contrary, the printed circuit support sheet in Margrain is laterally rigid and, coupled with the adherence of the two cylinders together, would appear to serve this purpose.

Second, there is no expectation of success. How would the potting material of Umeki be squeezed into the long and very narrow cylindrical gap between the concentric windings of Margrain when the printed circuit support sheet blocks entry of the potting material through the spacing between the conductive bands in each cylinder?

Finally, the combination would still not teach or suggest all of the claim limitations. The support sheet for the printed circuit in Margrain would still prevent the potting material in Umeki from extending "from a space between two adjacent conductive bands of . . . one winding portion to a space between two adjacent bands of the other winding portion," as required by claim 47.

It also would not be obvious to modify the sheet metal embodiment (Fig. 5) of Margrain to use the non-layered potting of Umeki. Again, there is no expectation of success. Umeki teaches that the potting process may cause shorts between the conductors if the conductors are not coated with insulation. *See* Col. 5, lines 34-36 (a "problem arises [] when one conductor comes into intimate contact with another conductor [unless] the conductor has been coated with insulation"). The sheet metal in Margrain is not coated with insulation and thus would be subject to the very shorting problem described by Umeki.[1] Indeed, this quoted language in Umeki actually teaches away from using non-layered potting with uncoated conductors.

In short, it would not be obvious to modify Margrain to create the invention in claim 47 in view of Umeki.

Claims 48-65 are each dependent from claim 47 and therefore include all of the limitations of claim 47. For the same reasons that are set forth above in connection with claim 47, these claims are also allowable.

[1] The Patent Office has not urged that it would also have been obvious to have substituted the coated wire taught by Umeki for the sheet metal in Margrain. To be sure, the resulting structure would then not contain the "sheet metal" and "pair of concentric" limitations in claim 47. Further, the coating would interfere with the coupling of one set of windings to the other, as also required by the language of this claim. The soldering that is discussed in the patent specification, for example, could not be effectuated if the conductors that needed to be soldered were coated.

Claim 49 also requires the potting material to comprise polyimide. In rejecting this claim, the Patent Office states that it would be obvious to select polyimide as the potting material as this was a "know material . . . suitable[] for [this] intended use." Applicants respectfully disagree. Although polyimide may have been known as a *coating* for wire that was used in motors, applicants are unaware that it was known as *potting material* for these wires. To the contrary, it was applicants' understanding that polyimide had properties that would have led the person of ordinary skill in the art away from using it as potting material. Should the Patent Office still claim otherwise, applicants request a citation to prior art that teaches the claimed potting use. *See* M.P.E.P. 2144.03(c) ("If applicant adequately traverses the examiner's assertion of official notice, the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained.")

In view of the foregoing amendments and remarks, it is respectfully submitted that this application is now in condition for allowance. Reconsideration and allowance are respectfully requested. Should any issues remain which the Examiner believes could be resolved in a telephone interview, the Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

Marc E. Brown
Registration No. 28,590

2049 Century Park East, 34th Floor
Los Angeles, CA 90067
(310)277-4110
Facsimile: (310)277-4730
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